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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/943,187	08/29/2001	Kristy A. Campbell	MI22-1742	8497

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EXAMINER	
DUONG, KHANH B	
ART UNIT	PAPER NUMBER
2822	

DATE MAILED: 08/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/943,187	CAMPBELL ET AL.	
	Examiner	Art Unit	
	Khanh Duong	2822	

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Peri d f r Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 June 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disp sition of Claims

4)☒ Claim(s) *1-51* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-33 and 42-51* is/are allowed.

6)☒ Claim(s) *34-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Pri rity under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *17* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

This Office Action is in response to the amendment, Paper No. 16, filed on June 10, 2003.

Accordingly, claims 34, 38, 39, 42, 46 and 47 were amended, and new claim 51 was added.

Currently, claims 1-51 are pending in the application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 34-37 and 39-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Huggett et al. (US 4,368,099).

Re claims 34-37, 40 and 41, Huggett et al. discloses a method of forming a chalcogenide structure (see col. 2, lines 17-36), comprising: forming a metal containing layer (Ag) over a chalcogenide glass layer (GeSe); irradiating the metal-containing layer to break a chalcogenide bond of the chalcogenide glass layer at the interface of the metal-containing layer and chalcogenide glass layer, such that at least a portion of the metal-containing layer diffuses into the chalcogenide glass layer; and, after the step of irradiating, exposing an outer surface of the chalcogenide glass layer to an iodine comprising fluid (potassium iodide/iodine solution),

wherein the iodine comprising fluid removes at least a portion (Ag layer) of the outer surface (see col. 2, lines 32-36).

Re claim 39, since Huggett et al. discloses the same process conditions as the instant invention, it should be inherent that the irradiating step is effective to form Ag_2Se as at least part of the outer surface of the chalcogenide glass layer and that the etching step is effective to etch away at least some of the Ag_2Se.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over Huggett et al.

Re claim 38, Huggett et al. fails to show specific concentration of potassium iodide solution.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Huggett et al. by selecting a specific concentration of potassium iodide solution within the range as required by the claim, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Allowable Subject Matter

Claims 1-33 and 42-51 are allowed.

The following is an examiner's statement of reasons for allowance: none of the prior art of record shows or fairly suggests all the process limitations as claimed. Specifically,

Re claim 1, none of the prior art of record discloses, in addition to other elements or processes as shown, the steps of: *irradiating the silver effective to break a chalcogenide bond of the chalcogenide material at an interface of the silver comprising layer and chalcogenide material and diffuse at least some of the silver into the chalcogenide material, and forming an outer surface of the chalcogenide material; after the irradiating, exposing the chalcogenide material outer surface to an iodine comprising fluid effective to reduce roughness of the*

chalcogenide material outer surface from what it was prior to the exposing; and after exposing, depositing a second electrode material over the chalcogenide material, and forming the second conductive electrode material into an electrode of the device.

Re claim 11, none of the prior art of record discloses, in addition to other elements or processes as shown, the steps of: *after forming the chalcogenide comprising material, forming Ag_2Se over the chalcogenide comprising material; exposing the Ag_2Se to an iodine comprising fluid effective to etch away at least some of the Ag_2Se; and after the exposing, depositing a second conductive electrode material over the chalcogenide material and forming the second conductive electrode material into an electrode of the device.*

Re claim 20, none of the prior art of record discloses, in addition to other elements or processes as shown, the steps of: *after forming the chalcogenide comprising material, forming a discontinuous layer of Ag_2Se over the chalcogenide comprising material; exposing the Ag_2Se to an iodine comprising fluid effective to etch away at least some of the Ag_2Se; and after the exposing, depositing a second conductive electrode material over the chalcogenide material, and which is continuous and completely covering at least over the chalcogenide material, and forming the second conductive electrode material into an electrode of the device.*

Re claim 26, none of the prior art of record discloses, in addition to other elements or processes as shown, the steps of: *irradiating the silver effective to break a chalcogenide bond of the chalcogenide material at an interface of the silver comprising layer and chalcogenide material and diffuse at least some of the silver into the chalcogenide material, the irradiating being effective to form a discontinuous layer of Ag_2Se over the chalcogenide comprising material, the irradiating being effective to maintain the chalcogenide material underlying the*

Ag_2Se in a substantially amorphous state; after the irradiating, exposing the Ag_2Se to an iodine comprising fluid effective to etch away at least a majority of the Ag_2Se; and after exposing, depositing a second electrode material over the chalcogenide material, and which is continuous and completely covering at least over the chalcogenide material, and forming the second conductive electrode material into an electrode of the device.

Re claim 42, none of the prior art of record discloses, in addition to other elements or processes as shown, the steps of: *irradiating the metal-containing layer to break a chalcogenide bond of the chalcogenide glass layer at the interface of the metal-containing layer and chalcogenide glass layer thereby creating an outside surface; removing at least a portion of the outside surface by etching with an iodine comprising fluid; and, after the step of removing at least a portion of the outside surface, forming a second conductive layer over at least a portion of the outside surface remaining after the act of removing.*

Re claim 51, none of the prior art of record discloses, in addition to other elements or processes as shown, the steps of: *irradiating the metal-containing layer to break a chalcogenide bond of the chalcogenide glass layer at the interface of the metal-containing layer and chalcogenide glass layer thereby creating an outside surface; the step of irradiating is effective to form Ag_2Se as at least part of the outside surface; removing at least a portion of the outside surface by etching with an iodine comprising fluid, said etching being effective to etch away at least some of the Ag_2Se; and, after the step of removing at least a portion of the outside surface, forming a second conductive layer over at least a portion of the outside surface remaining after the act of removing.*

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Response to Arguments

Applicant's arguments filed June 10, 2003 have been fully considered but they are not persuasive.

Applicant persistently argues that Huggett et al. does not teach that the iodine comprising fluid removes at least a portion of the outer surface of the chalcogenide glass layer. The Examiner disagrees because Huggett et al. clearly discusses at column 2, lines 32-36 using an acid solution such as a potassium iodine/iodine solution to remove the silver layer in the non-irradiated portion of the GeSe film. The silver layer being removed is a portion of the outer surface of the chalcogenide glass layer (GeSe film).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh Duong whose telephone number is (703) 305-1784. The examiner can normally be reached on Monday - Friday (9:00 AM - 6:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian, can be reached on (703) 308-4905. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

KBD
August 15, 2003

AMIR ZARABIAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800